

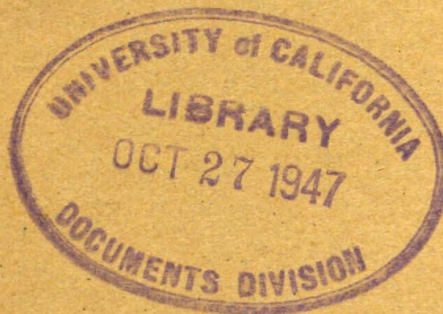
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1945

TM 11-1221

WAR DEPARTMENT TECHNICAL MANUAL

U.S. Dept. of Army

TEST SET AN/MPM-5



RESTRICTED. DISSEMINATION OF RESTRICTED MATTER.
No person is entitled solely by virtue of his grade or position to knowledge or possession of classified matter. Such matter is entrusted only to those individuals whose official duties require such knowledge or possession. (See also paragraph 23b, AR 380-5, 15 March 1944.)

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2 APRIL 1945

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WAR DEPARTMENT

WASHINGTON 25, D. C., 2 APRIL 1945.

TM 11-1221, Test Set AN/MPM-5, is published for the information and guidance of all concerned.

[A. G. 300.7 (11 Nov 44).]

BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL,
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OFFICIAL:

J. A. ULIO,
Major General,
The Adjutant General.

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(For explanation of symbols see FM 21-6.)

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DESTRUCTION NOTICE

WHY—To prevent the enemy from using or salvaging this equipment for his benefit.

WHEN—When ordered by your commander.

- HOW** — 1. Smash—Use sledges, axes, handaxes, pickaxes, hammers, crowbars, heavy tools.
2. Cut—Use axes, handaxes, machetes.
3. Burn—Use gasoline, kerosene, oil, flame throwers, incendiary grenades.
4. Explosives—Use firearms, grenades, TNT.
5. Disposal—Bury in slit trenches, fox holes, other holes. Throw in streams. Scatter.

USE ANYTHING IMMEDIATELY AVAILABLE FOR DESTRUCTION OF THIS EQUIPMENT

- WHAT**—1. Smash—Tuning assemblies, tubes, meters, dials, switches, cases, chassis.
2. Cut—Cables, wiring, transformer windings, choke windings.
3. Burn—Manuals, schematic diagrams, wooden cases, data supplied with test equipment.
4. Bend—Metal cases, chassis, nameplates.
5. Bury or scatter—All of the above material after destroying its usefulness.

DESTROY EVERYTHING

RESTRICTED

TEST SET AN/MPM-5

1. GENERAL.

Test Set AN/MPM-5 consists of the special test equipment for Radio Sets SCR-582-A, SCR-582-T6, and SCR-682-A, and for Radio Equipments RC-182-A and RC-282-A. When the equipment included in this test set is used in conjunction with Test Set AN/GPM-1, all equipment necessary for third echelon maintenance will be available. Instructions covering the use of the test equipment with a specific radio set may be obtained from the technical manuals applicable to that set. The test set is carried in two wooden chests mounted on shock-mounted bases in the van which carries Test Set AN/GPM-1. Power for operating the test equipment can be obtained either from Power Unit PE-95 or from a commercial source. Outlet boxes for 115-volt, 60-cycle a-c power are conveniently arranged on both sides of the van. In addition, 6-volt, 12-volt, and 24-volt d-c power is supplied by batteries located in the front of the van.

2. LIST OF COMPONENTS.

The components of Test Set AN/MPM-5 and technical manuals (TM) applicable to these components are listed below.

<i>Quan</i>	<i>Name of component</i>	<i>TM ref</i>
1	Oscilloscope TS-34/AP	TM 11-1067
1	Echo Box TS-207/UP	} TM 11-1212 TM 11-1561
1	Fluxmeter TS-15A/AP	
1	Power Meter TS-125/AP	TM 11-2559
1	Range Calibrator I-223-A	TM 11-1217
1	Signal Generator TS-155A/UP	} TM 11-2528 TM 11-1508
1	Signal Generator TS-301/U	
1	Wavemeter Test Set TS-117/GP	TM 11-2657
1	Emergency receiver tuner	TM 11-2639
1	Voltage multiplier	TM 11-2538
1	Capacity divider	TM 11-1561
1	Terminal Box J-74/MPM	TM 11-1561
1		TM 11-1512
1		TM 11-1212

<i>Quan</i>	<i>Name of component</i>	<i>TM ref</i>
1	Antenna Assembly AS-23/AP	{ TM 11-2657 TM 11-1212 TM 11-1561 TM 11-2538
1	Dummy Antenna TS-208/MPM	{ TM 11-1308 TM 11-1508
1	Probe Antenna AT-64/U	TM 11-1512
1	Test Antenna TS-210/MPM	{ TM 11-1308 TM 11-1508
1	Cord CG-70/MPM	TM 11-1212
2	Cord CG-71/MPM	TM 11-1212
2	Adapter M-358	TM 11-1308
2	Adapter M-359	TM 11-1308
1	Crystal Adapter UG-119/UP	TM 11-1212
2	Radio Frequency Jack UG-30/U	
2	Plug PL-258	
2	Chest CH-273	
10	Lamp LM-54	TM 11-1361
1	Case, neon lamp	TM 11-1361
10	Tube, crystal, 1N21B	
1	Resistor, dummy load	TM 11-1512
8	Battery BA-30	{ TM 11-2559 TM 11-1217
1	Spanner Wrench MX-219/UP	TM 11-1212
1	Thermometer and case	TM 11-1212

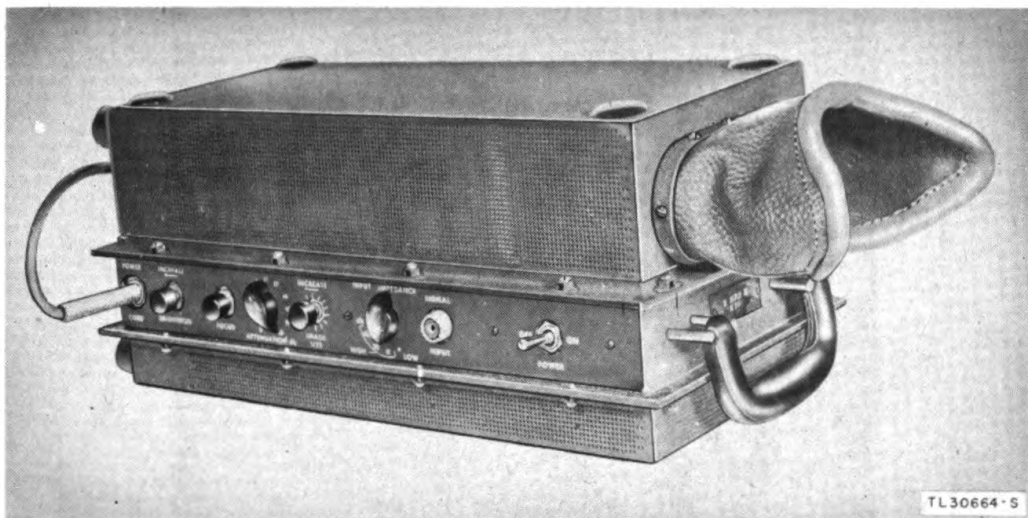


Figure 1. Oscilloscope TS-34/AP.

3. OSCILLOSCOPE TS-34/AP.

Oscilloscope TS-34/AP is a small portable instrument used for observing electrical waveforms and for measuring their voltage and duration. Normally, signal voltages up to 100 volts peak amplitude may be observed. When used with a probe assembly which is supplied with the oscilloscope, signal voltages having a peak amplitude of 450 volts may be observed. The capacity divider (par. 13) may be used to increase the range further to include signals having peak amplitudes up to 15,000 volts. The instrument may be used either as an ordinary oscilloscope with a saw-tooth sweep or as a synchroscope with a start-stop sweep synchronized by the input signal. The oscilloscope uses a 2-inch cathode-ray tube inclosed in an iron tube which serves as a shield against extraneous light and against electric and magnetic fields. A lens within the viewing tube magnifies the images and enables the operator to observe the screen comfortably from a closer position than would otherwise be possible. A soft eyeshade or hood is provided on the top of the oscilloscope. All controls and connectors are located in protecting channels along the sides of the oscilloscope. Signal input connections are made by means of special jacks and cables provided with the oscilloscope. A suitcase-type carrying case is provided with space for a probe assembly and the operating cords and cables which are supplied with the oscilloscope. Detailed information covering installation, operation, functioning of parts, and preventive maintenance of the oscilloscope is contained in TM 11-1067, Oscilloscope TS-34/AP.

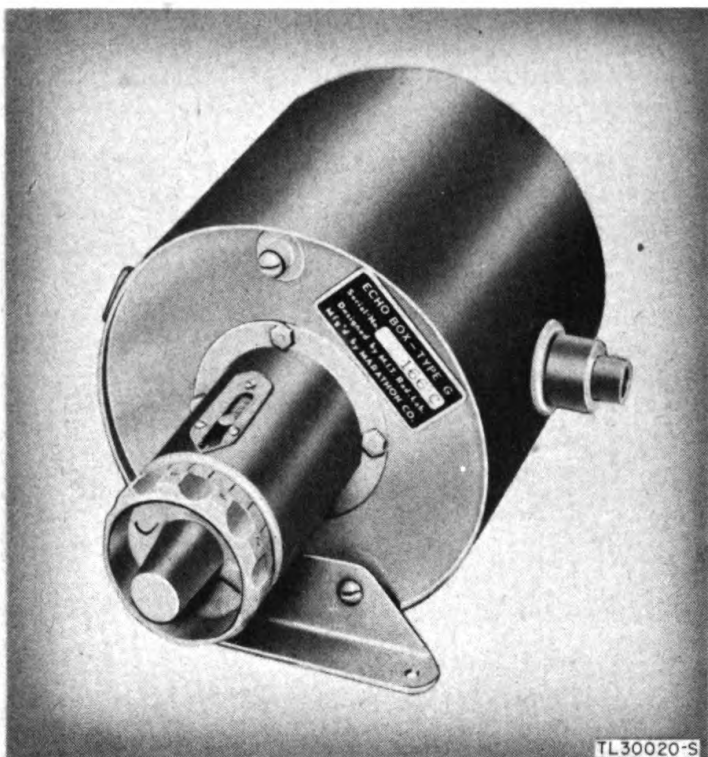


Figure 2. Echo Box TS-207/UP.

4. ECHO BOX TS-207/UP (fig. 2).

Echo Box TS-207/UP is a cylindrical resonant cavity used in checking frequencies, power output, and over-all performance of radar equipment. The cavity is tuned to resonance by a knob at the end of the echo box. A calibration chart is provided to indicate the resonant frequency at various settings of the control knob. Coupling loops on either side of the cavity provide a means for feeding energy into and out of the echo box. In operation the radio-frequency (r-f) energy radiated from the radar set under test is picked up by Antenna Assembly AS-23/AP (par. 15) and fed to one coupling loop of the echo box by means of Cord CG-70/MPM (par. 19). The output of the echo box is rectified by crystal 1N21B (par. 28) which is attached to the other coupling loop by Crystal Adapter UG-119/UP (par. 23). Cord CG-71/MPM (par. 20) and Terminal Box J-74/MPM (par. 14) are used to feed the rectified signal to an indicating microammeter. Test Set I-179, supplied with Test Set AN/GPM-1 may be used as a microammeter. Spanner Wrench MX-219/UP (par. 31) is used for tightening the coupling loops on the echo box. Detailed information on the echo box is contained in TM 11-1212, Echo Box TS-207/UP. Specific instructions for using the echo box with Radio Set SCR-682-A appear in paragraph 72 of TM 11-1561, Service Manual for Radio Set SCR-682-A.

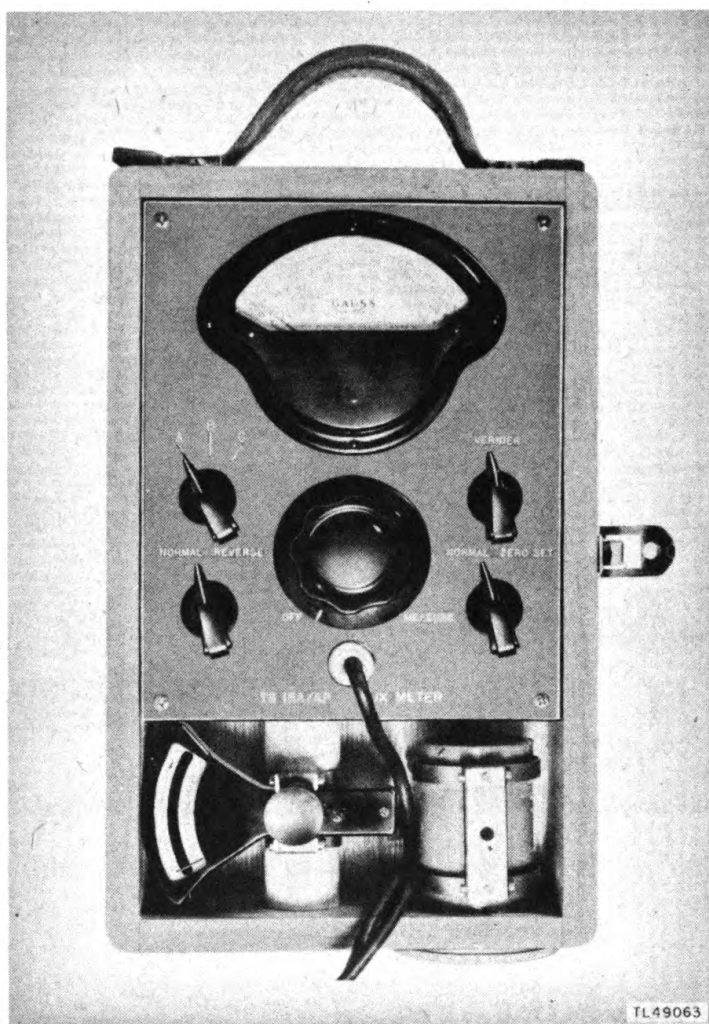


Figure 3. Fluxmeter TS-15A/AP.

5. FLUXMETER TS-15A/AP (fig. 3).

Fluxmeter TS-15A/AP is a portable self-contained test instrument designed to measure in gaussess the magnetic flux densities between the poles of magnets used in X- and S-band transmitters. The major components of the fluxmeter are a probe meter and a gaussmeter connected by a shielded cable. In operation the probe meter is placed between the poles of the magnet, the needle on the probe meter is adjusted to a calibration mark, and the flux density is read on the gaussmeter. The probe meter, the 1.5-volt battery which supplies the operating power, and the shielded cable are stored in the wooden case which contains the gaussmeter. A complete description of the installation, operation, preventive maintenance, and functioning of the parts of Fluxmeter TS-15A/AP is given in TM 11-2559.

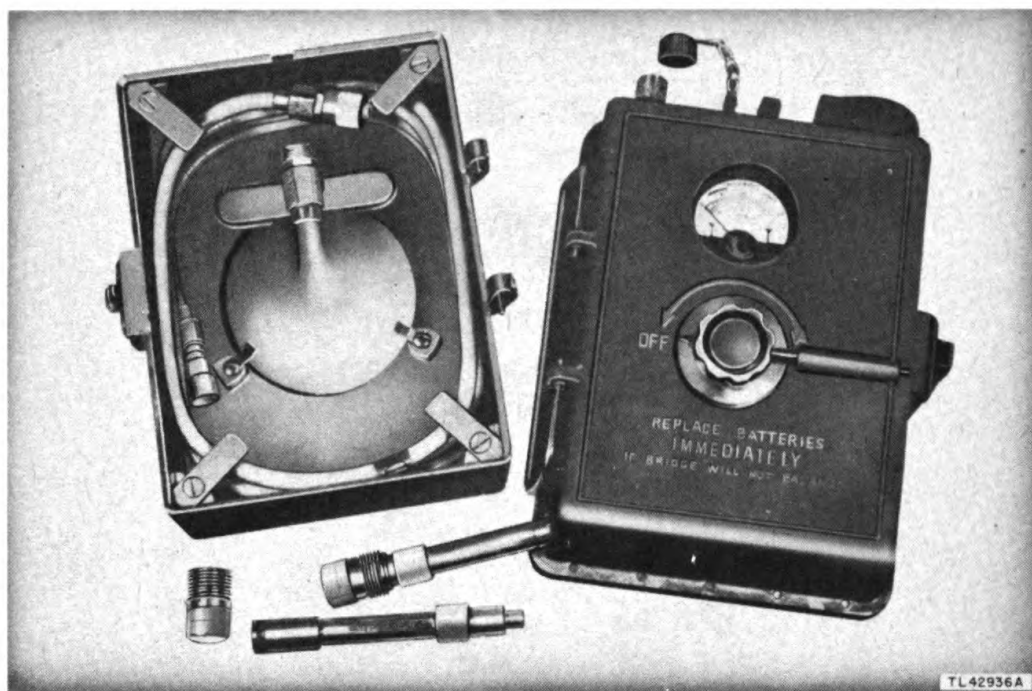


Figure 4. Power Meter TS-125/AP.

6. POWER METER TS-125/AP (fig. 4).

Power Meter TS-125/AP is a compact battery-operated wattmeter used for measuring r-f power. The instrument is encased in a cast aluminum box with an indicating meter and balance control on the top. A pick-up horn antenna and a length of r-f cable are stored in the lid, and two attenuators are stored in compartments in the case. Power for the instrument is obtained from three standard flashlight batteries. In operation the r-f energy is fed to the power meter either by means of the pick-up antenna or by a direct connection to a directional coupler on the radar set being tested. The attenuators provided with the meter are used to increase the range of the meter by attenuating the r-f power. They are connected between the r-f cable and the input connector on the meter. The instrument reads average r-f power. A detailed description of the meter and information on installation, operation, preventive maintenance, theory, and trouble shooting will be found in TM 11-1217, Power Meter TS-125/AP.

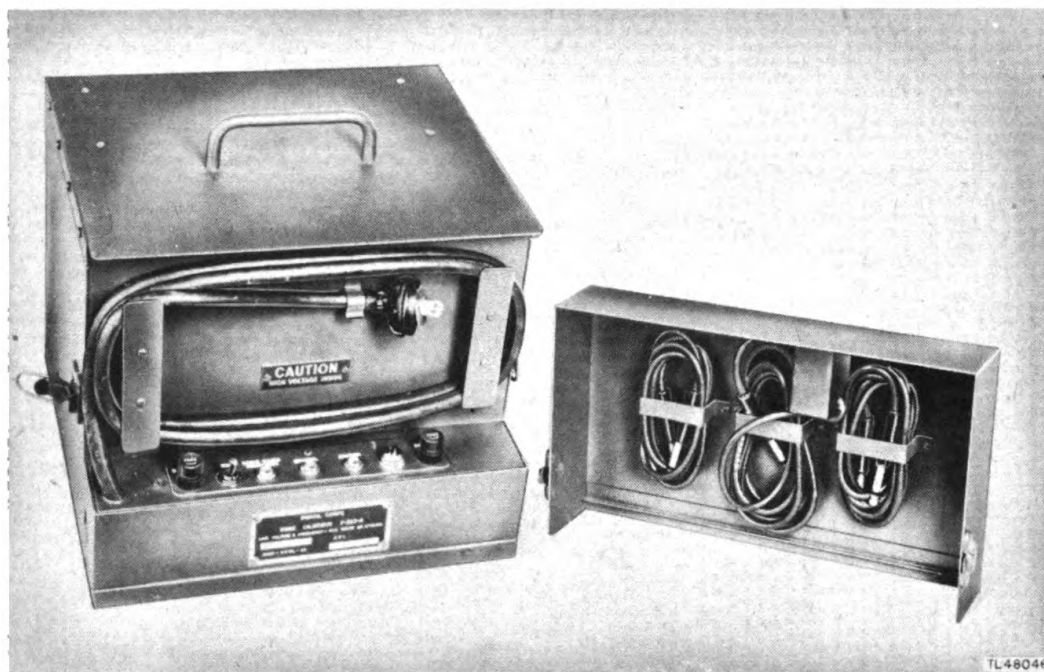


Figure 5. Range Calibrator I-223-A.

7. RANGE CALIBRATOR I-223-A (fig. 5).

Range Calibrator I-223-A is used to calibrate the range indication of Radio Equipments RC-182-A and RC-282-A. The calibrator produces three outputs: a sine-wave output at 163.94 kilocycles; a synchronizing pulse; and a range-marker pulse having a very short duration and a repetition frequency corresponding to a range separation of 1,000 yards between pulses. The range calibrator is housed in a metal case and is designed to operate from a 115-volt a-c power source. The panel cover contains three cables which are used to connect the calibrator to the radar set control unit under test and also to an oscilloscope. Ordinarily, the synchronizing pulse is used to trigger the control unit of the radar set being tested and the range-marker pulses are fed to the radar A-scope where they appear as pips separated by 1,000 yards of range. The range indications of the radar set may then be compared with the range as indicated by the range-marker pips. Detailed information covering operation, functioning of parts, and preventive maintenance of the range calibrator is given in TM 11-2528, Range Calibrator I-223-A. Specific instructions for the use of the range calibrator with Radio Equipments RC-182-A and RC-282-A are given in paragraph 92 of TM 11-1308, Technical Operation of Radio Equipments RC-182-A and RC-282-A.

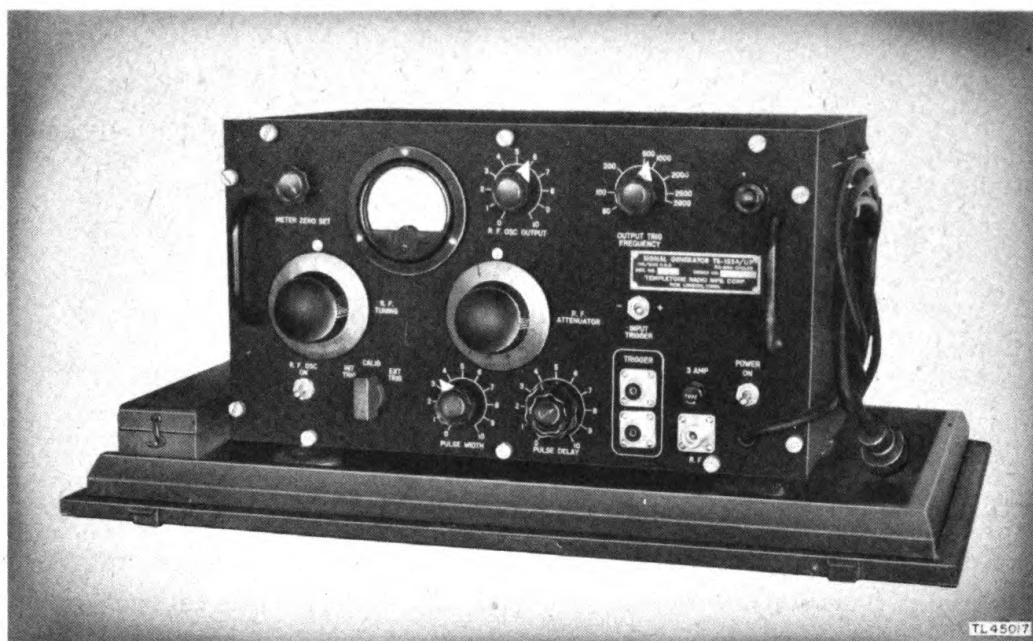


Figure 6. Signal Generator TS-155A/UP.

8. SIGNAL GENERATOR TS-155A/UP (fig. 6).

Signal Generator TS-155A/UP is used for testing radar sets operating at frequencies in the S-band. It produces a calibrated, pulse-modulated r-f signal. The instrument may be used for checking the sensitivity of the radar receiver or as an r-f wattmeter for measuring the power output of the radar transmitter. The signal generator is housed in a metal case with all controls on the front panel. It is shock-mounted in a wooden transit case which also contains necessary operating accessories. A detailed description covering installation, operation, functioning of parts, and preventive maintenance of the signal generator will be found in TM 11-2657, Signal Generators TS-155/UP and TS-155A/UP.

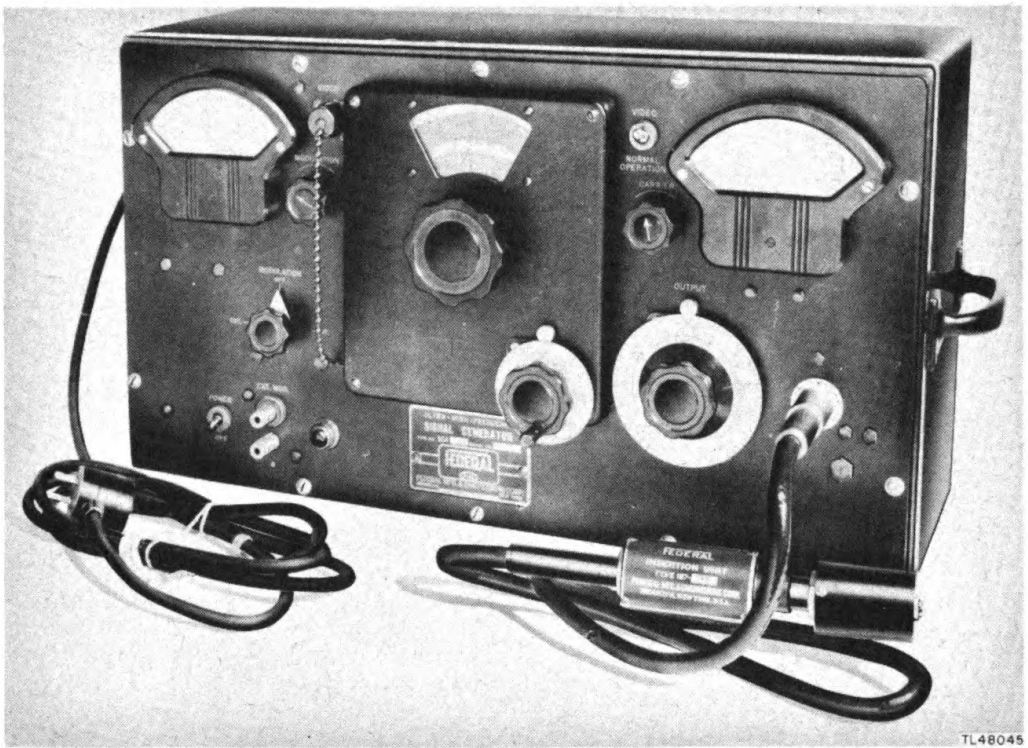
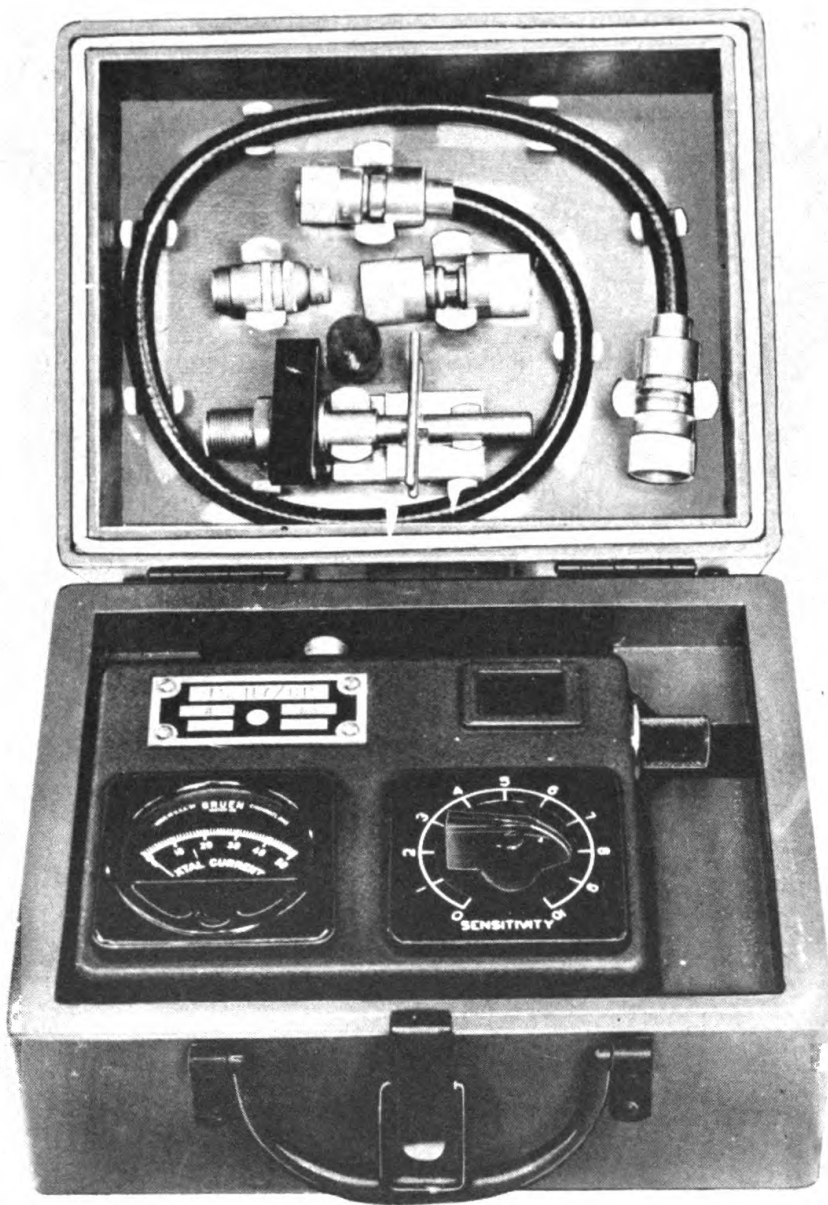


Figure 7. Signal Generator TS-301/U.

9. SIGNAL GENERATOR TS-301/U (fig. 7).

Signal Generator TS-301/U produces modulated or unmodulated r-f voltages over a continuous range of frequencies from 7.6 megacycles to 330 megacycles. The generator is used for alignment of the i-f stages in the receivers of Radio Sets SCR-582-A, SCR-582-T6, and SCR-682-A. It is also used for an over-all check of receiver and transmitter frequencies of Radio Equipments RC-182-A and RC-282-A. The r-f output voltage may be varied from 1 to 20,000 microvolts by a calibrated dial on the front panel. It is self-contained in a metal case with all controls on the front panel. For a detailed description covering installation, operation, functioning of parts, and preventive maintenance of the signal generator, refer to TM 11-2639, Signal Generator TS-301/U (Signal Generator, Federal Model 804-CS-1).



TL48039

Figure 8. Wavemeter Test Set TS-117/GP.

10. WAVEMETER TEST SET TS-117/GP (fig. 8).

Wavemeter Test Set TS-117/GP is used for measuring frequencies of radar sets operating in the S-band. The test set is a self-contained unit requiring no power for its operation. It is housed in a metal case with all controls readily accessible. A calibration chart is mounted on the back. Frequency measurements may be made either by placing the set in the field of r-f energy or by making a direct connection to

the source of r-f energy. In making frequency measurements a cavity is tuned to resonance by means of a micrometer head whose reading is converted to frequency by means of the calibration chart provided. For complete information covering installation, operation, functioning of parts, and preventive maintenance of the test set, refer to TM 11-2538, Wavemeter Test Set TS-117/GP.

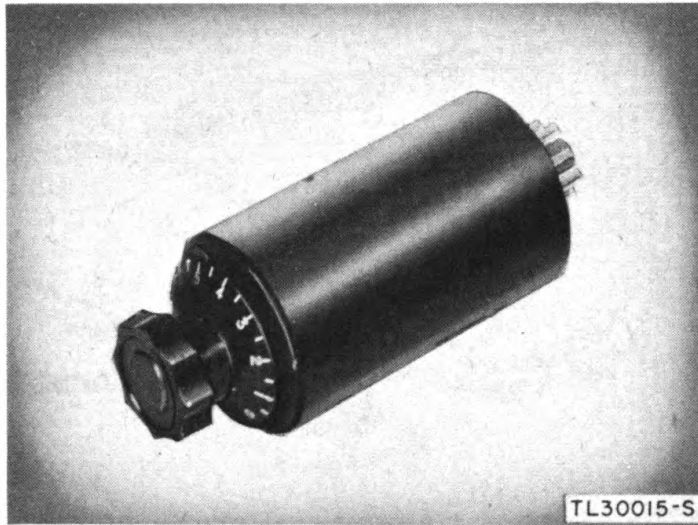


Figure 9. Emergency receiver tuner.

11. EMERGENCY RECEIVER TUNER (fig. 9).

The emergency receiver tuner is used to control manually the frequency of the local oscillator of the S-band receiver used in Radio Set SCR-682-A. It replaces the gas triode normally used for automatic frequency control (afc). The tuner consists of a 250,000-ohm potentiometer and a fixed 200,000-ohm resistor mounted in a bakelite tube approximately 3 inches long and 1¼ inches in diameter. On one end of the tube is an octal base which fits into the tube socket in place of the type 884 gas triode which normally controls the frequency. A tuning knob and dial are mounted on the other end. In operation the tuner is inserted in the octal socket replacing the type 884 gas triode and the frequency control voltage is adjusted by means of the tuning knob mounted on the end of the tuner. Detailed information on the emergency receiver tuner is given in paragraph 97d of TM 11-1561, Service Manual for Radio Set SCR-682-A.

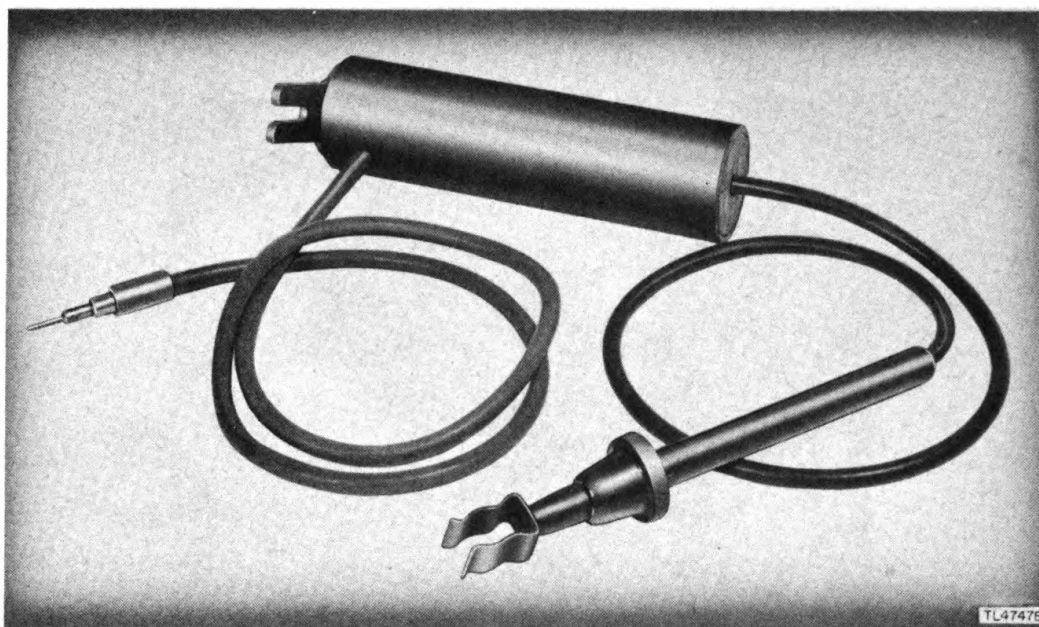


Figure 10. Voltage multiplier.

12. VOLTAGE MULTIPLIER (fig. 10).

The voltage multiplier is a resistance-type voltage divider used to increase the voltage range of the Simpson meter, supplied with Radio Sets SCR-582-A, SCR-582-T6, and SCR-682-A, to 10,000 volts. The multiplier is made up of twelve $\frac{1}{2}$ -watt resistors inclosed in a bakelite tube approximately $1\frac{1}{4}$ inches in diameter and 6 inches long. On one end is mounted a ground lug and attached to the other end is the high-voltage lead. The meter lead is attached to the body of the multiplier near the ground-lug end. Detailed information on the voltage multiplier and its installation and operation is contained in paragraph 85c of TM 11-1561, Service Manual for Radio Set SCR-682-A.

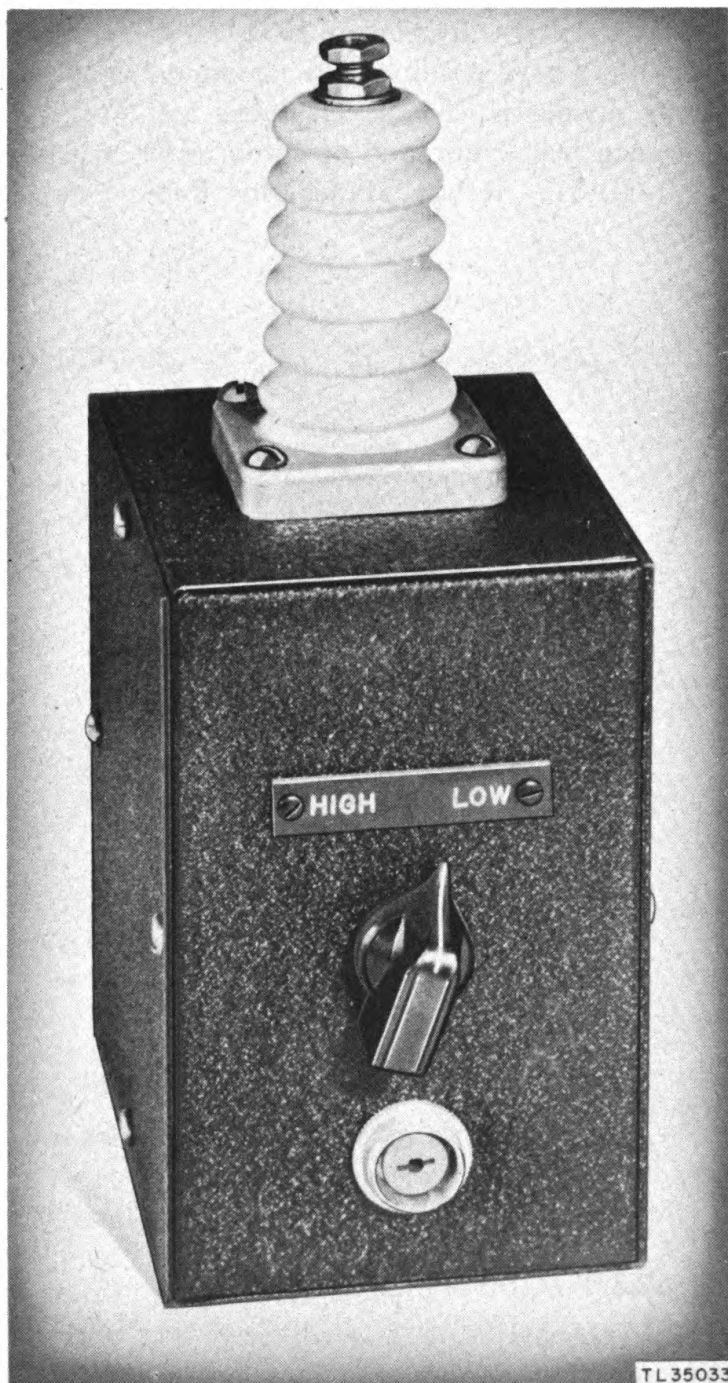


Figure 11. Capacity divider.

13. CAPACITY DIVIDER (fig. 11).

The capacity divider is used to enable high-amplitude signal voltages to be viewed on a test oscilloscope. It consists of three capacitors housed in a metal case. A large insulator is mounted on the top of the case to separate the high-voltage input terminal from ground. A switch with two positions, HIGH and LOW, is mounted on the front of the

case and provides a voltage division of 15 to 1 for the HIGH position and 100 to 1 for the LOW position. The maximum signal input voltage with the capacity divider is 15,000 volts peak amplitude. For detailed information covering installation and operation, refer to paragraphs 67a and 88e of TM 11-1512, Service Manual for Radio Sets SCR-582-A and SCR-582-T6.

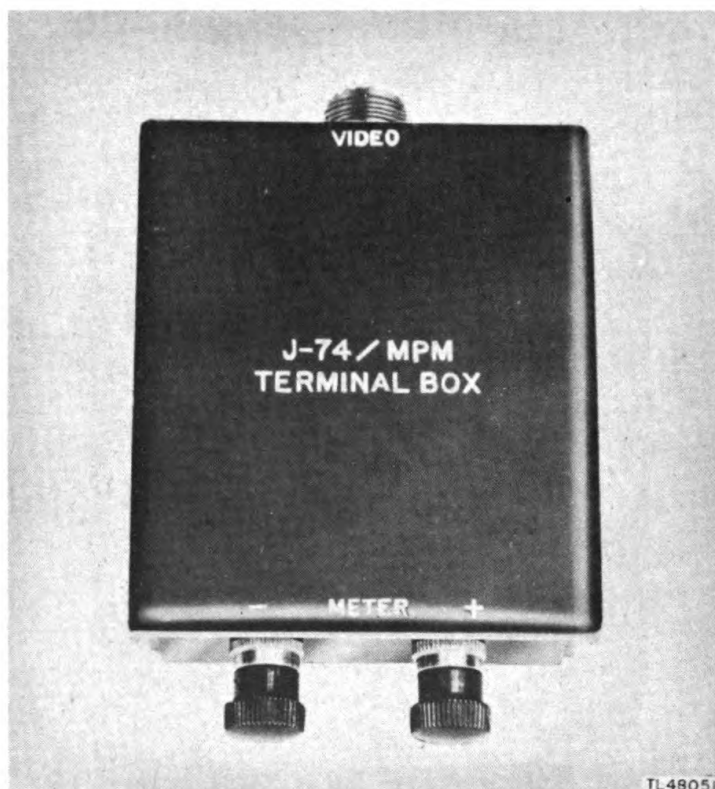


Figure 12. Terminal Box J-74/MPM.

14. TERMINAL BOX J-74/MPM (fig. 12).

Terminal Box J-74/MPM is a small steel box with a removable cover. At one end of the box is a receptacle, Socket SO-239, labeled VIDEO, and at the other end are two screw-type terminals. The box contains a 2-microfarad, 600-volt, oil-filled capacitor. The terminal box is used with Echo Box TS-207/UP (par. 4). It permits the use of a universal-type test meter, Test Set I-179 supplied with Test Set AN/GPM-1, for measuring the output of Crystal Adapter UG-119/UP (par. 23) whose output is fed by a coaxial cable to the video receptacle on the terminal box. The test meter leads are connected to the screw-type terminals on the other end of the terminal box.

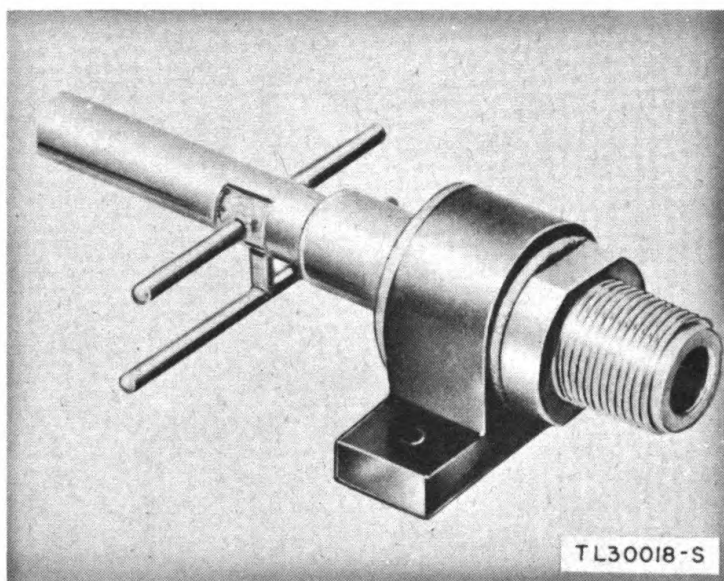


Figure 13. Antenna Assembly AS-23/AP.

15. ANTENNA ASSEMBLY AS-23/AP (fig. 13).

Antenna Assembly AS-23/AP is an S-band antenna with a type N receptacle at the base. It consists of two quarter-wavelength rods connected to a coaxial line, with a half-wavelength reflector rod mounted behind the dipole. It is used with Echo Box TS-207/UP (par. 4), Signal Generator TS-155A/UP (par. 8), and Wavemeter Test Set TS-117/GP (par. 10).



Figure 14. Dummy Antenna TS-208/MPM.

16. DUMMY ANTENNA TS-208/MPM (fig. 14).

Dummy Antenna TS-208/MPM is a Plug PL-259-A with a 47-ohm, 1-watt resistor soldered between the center pins and the shell inside of the connector. It is used in the alignment of Radio Receiver and Transmitter BC-1267-A, a component of Radio Equipments RC-182-A and RC-282-A. For detailed information covering installation and operation of the dummy antenna, refer to paragraph 85 in TM 11-1308, Technical Operation, Radio Equipments RC-182-A and RC-282-A.

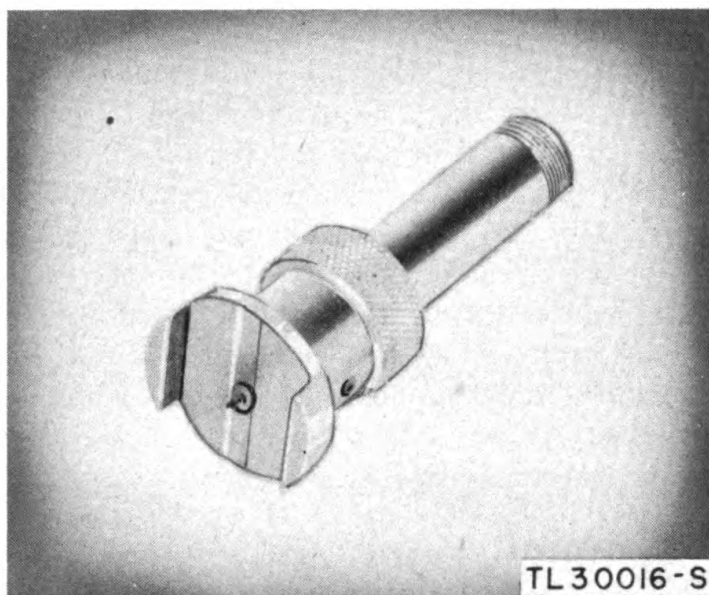


Figure 15. Probe Antenna AT-64/U.

17. PROBE ANTENNA AT-64/U (fig. 15).

Probe Antenna AT-64/U is a bolometer head used for measuring standing-wave ratios. It is composed of two cylindrical sections joined together by a sleeve nut. One end of the larger cylinder is shaped to fit into a slotted section of r-f line located in the transmitter cabinet of Radio Sets SCR-582-A and SCR-582-T6. It contains a small pick-up loop which projects into the transmission line and picks up r-f energy. Coupling loops feed the r-f energy to a 10-ma Littelfuse contained in the smaller section of the bolometer probe which is threaded for a cable connection. For a detailed description of the probe antenna, refer to paragraph 68 of TM 11-1512, Service Manual for Radio Sets SCR-582-A and SCR-582-T6.

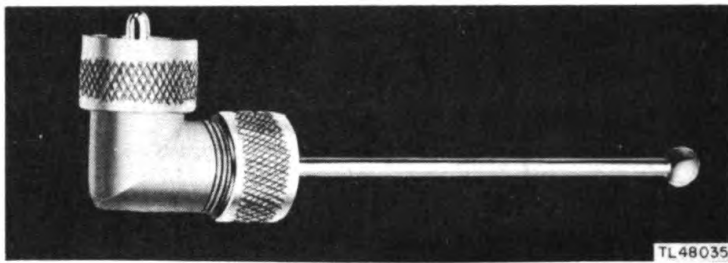


Figure 16. Test Antenna TS-210/MPM.

18. ANTENNA TS-210/MPM (fig. 16).

Test Antenna TS-210/MPM consists of Adapter M-359 (par. 22) and a 4-inch silver-plated steel rod with a phenolic knob 5/16 inch in diameter cemented on one end. The female end of the adapter is capped and the steel rod is inserted through a hole in the cap and soldered to the center conductor of the adapter. The antenna is used in conjunction with Adapter M-358 (par. 21) and Dummy Antenna TS-208/MPM (par. 16) in the alignment of Radio Receiver and Transmitter BC-1267-A, a component of Radio Equipments RC-182-A and RC-282-A. For detailed information refer to paragraph 85 in TM 11-1308, Technical Operation, Radio Equipments RC-182-A and RC-282-A.

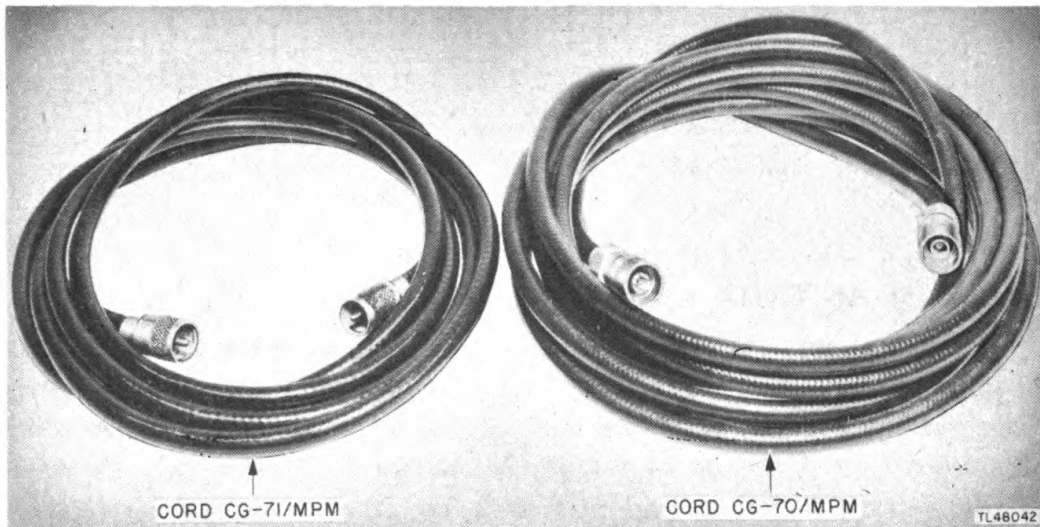


Figure 17. Cords CG-70/MPM and CG-71/MPM.

19. CORD CG-70/MPM (fig. 17).

Cord CG-70/MPM is a 15-foot length of Radio Frequency Cable RG-9/U terminated at each end with Radio Frequency Plug UG-24/U. Radio Frequency Cable RG-9/U is a stranded, single-conductor, double-shielded, r-f cable with vinyl covering. The cable is used to connect Echo Box TS-207/UP (par. 4) or Signal Generator TS-155A/UP (par. 8) to Antenna Assembly AS-23/AP (par. 15).

20. CORD CG-71/MPM (fig. 17).

Cord CG-71/MPM is a 6-foot length of Radio Frequency Cable RG-13/U terminated at each end with a Plug PL-259. Radio Frequency Cable RG-13/U is a stranded, single-conductor, double-shielded, r-f cable with a vinyl protective covering. It is used to connect the output of Echo Box TS-207/UP to Terminal Box J-74/MPM (par. 14).

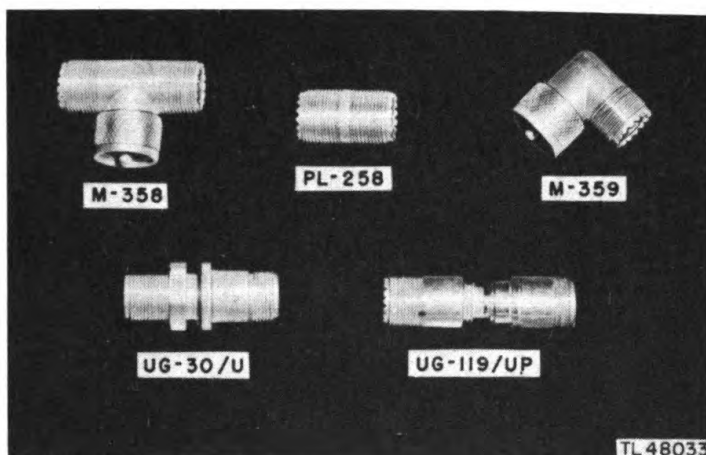


Figure 18. Connectors.

21. ADAPTER M-358 (fig. 18).

Adapter M-358 is a T-type connector consisting of two female Sockets SO-239 and a male Plug PL-259. It is used to connect Dummy Antenna TS-208/MPM (par. 16) and Test Antenna TS-210/MPM (par. 18) to the receiver-transmitter of Radio Equipments RC-182-A and RC-282-A for alignment purposes.

22. ADAPTER M-359 (fig. 18).

Adapter M-359 is a video-type, male-to-female, right-angle connector. It connects Socket SO-239 and Plug PL-259. It is used with Adapter M-358 for alignment of Radio Receiver BC-1267-A, a component of Radio Equipments RC-182-A and RC-282-A.

23. CRYSTAL ADAPTER UG-119/UP (fig. 18).

Crystal Adapter UG-119/UP has a type N plug on one end and a Socket SO-239 on the other end. This adapter serves as a holder for crystal 1N21B which is used with Echo Box TS-207/UP (par. 4).

24. RADIO FREQUENCY JACK UG-30/U (fig. 18).

Radio Frequency Jack UG-30/U is a double-ended connector with a type N receptacle at each end. It is used to connect two r-f cables in order to provide increased cable length.

25. PLUG PL-258 (fig. 18).

Plug PL-258 is a video-type cable connector with two female Sockets SO-239. It fits the male portion of Plug PL-259 and permits the inter-connecting of cables terminating in Plug PL-259.

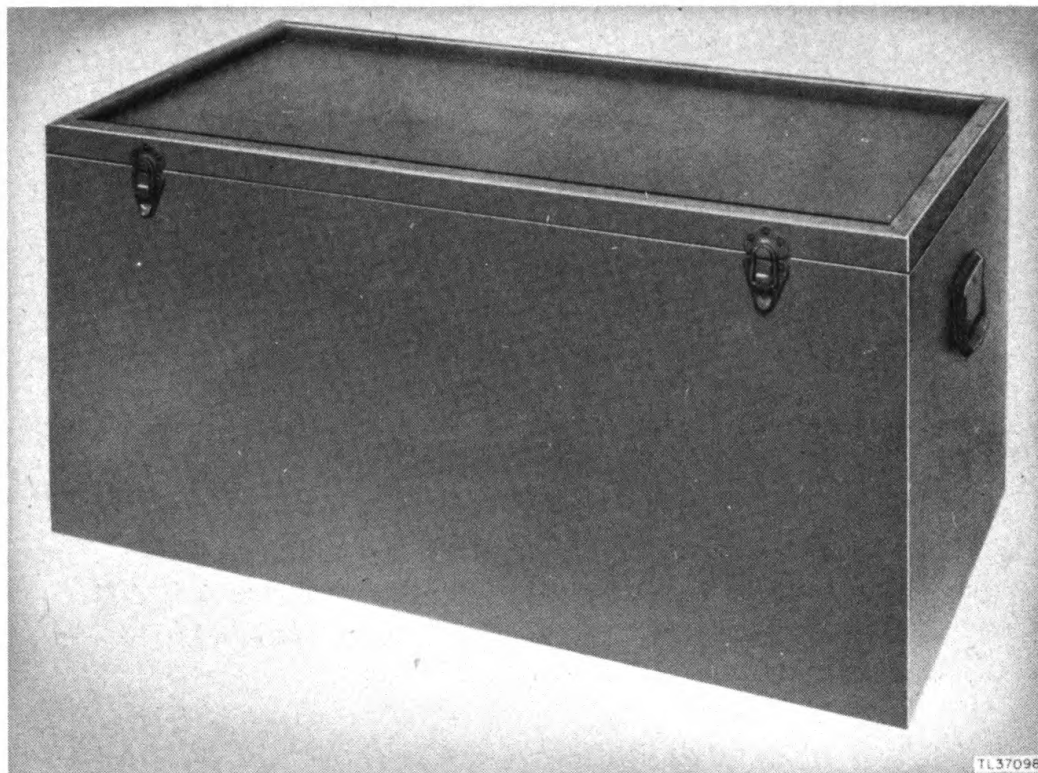


Figure 19. Chest CH-273.

26. CHEST CH-273 (fig. 19).

Chest CH-273 is a wooden chest $42\frac{1}{2}$ inches long, $22\frac{1}{4}$ inches wide, and $20\frac{3}{4}$ inches high. Two of these chests are provided for carrying the test equipment and for storing it when it is not in use.

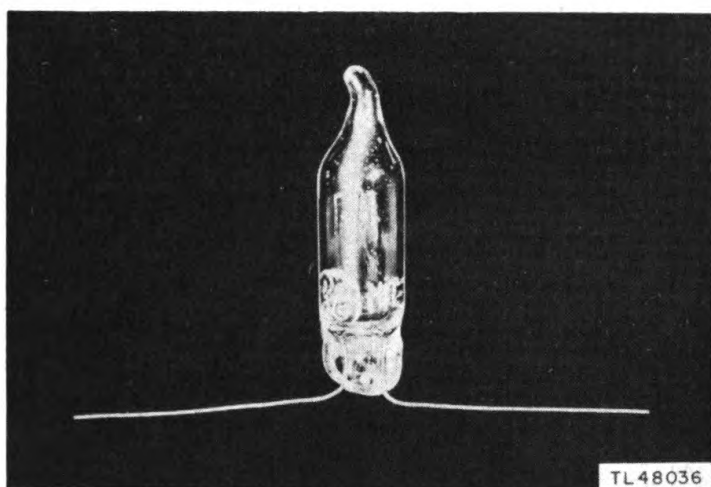


Figure 20. Lamp LM-54.

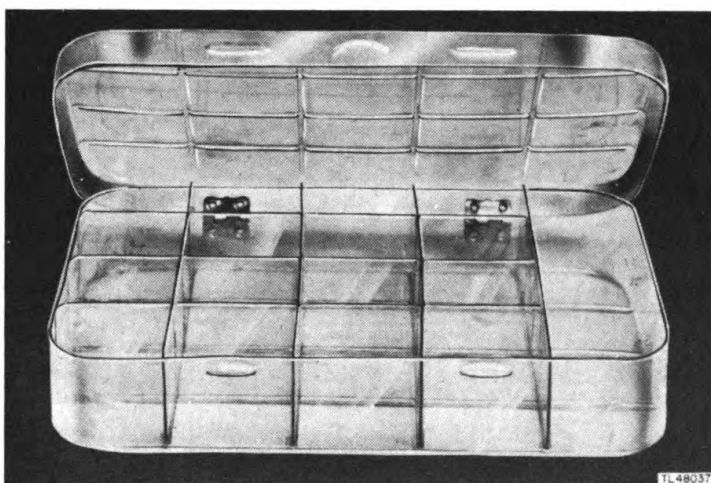


Figure 21. Carrying case for neon lamps.

27. LAMP LM-54 AND CASE (figs. 20 and 21).

Lamp LM-54 is a general utility neon lamp used to detect the presence of r-f power in the various circuits of the radio set under test. Ten of these lamps are provided in a plastic carrying case.

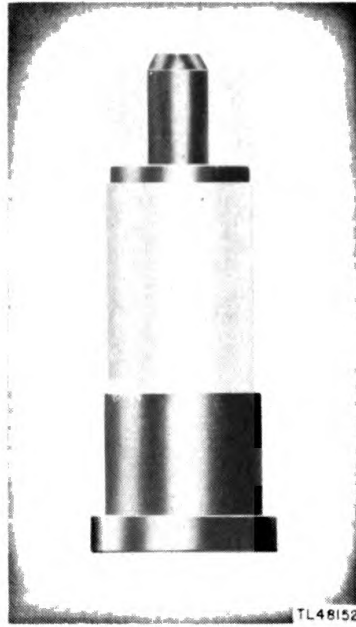


Figure 22. Crystal 1N21B.

28. CRYSTAL 1N21B (fig. 22).

Crystal 1N21B is a cartridge type crystal used as a detector with Echo Box TS-207/UP (par. 4). It is held in Crystal Adapter UG-119/UP (par. 23).

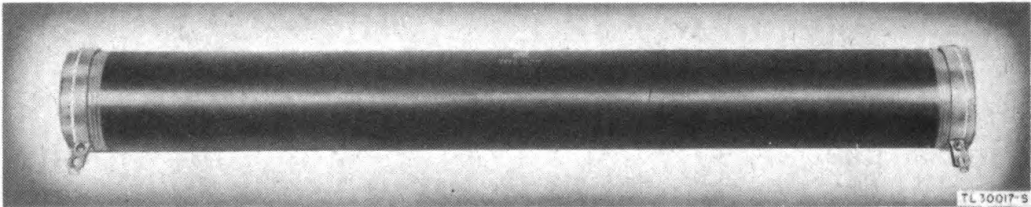


Figure 23. Dummy load resistor.

29. DUMMY LOAD RESISTOR (fig. 23).

The dummy load resistor is a 1,000-ohm, 100-watt, metalized, high-frequency power resistor. It is used to replace the magnetron in the transmitter circuit of Radio Sets SCR-582-A and SCR-582-T6 when making certain trouble-shooting tests. For detailed instructions covering installation and operation, refer to paragraphs 67b and 88f in TM 11-1512, Service Manual for Radio Sets SCR-582-A and SCR-582-T6.



Figure 24. Battery BA-30.

30. BATTERY BA-30 (fig. 24).

Battery BA-30 is a standard 1.5-volt dry cell. Eight of these batteries are supplied for use with Fluxmeter TS-15A/AP (par. 5) and Power Meter TS-125/AP (par. 6).

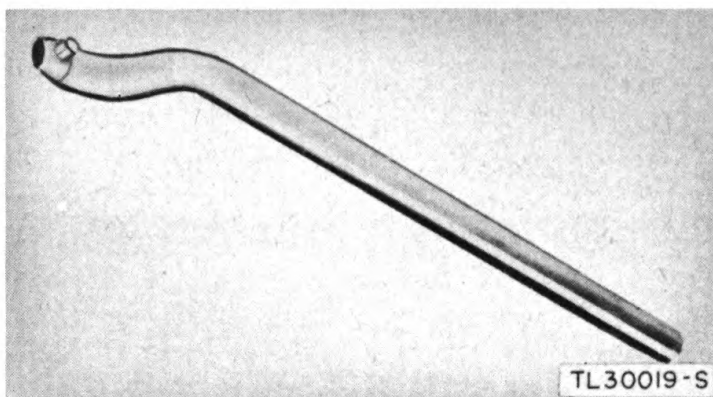


Figure 25. Spanner Wrench MX-219/UP.

31. SPANNER WRENCH MX-219/UP (fig. 25).

Spanner Wrench MX-219/UP is a steel tool 6 inches long and $\frac{1}{4}$ inch thick. One end is curved, with a $\frac{1}{8}$ -inch diameter steel pin near the end. The tool is used to tighten the coupling loop nuts of Echo Box TS-207/UP (par. 4).

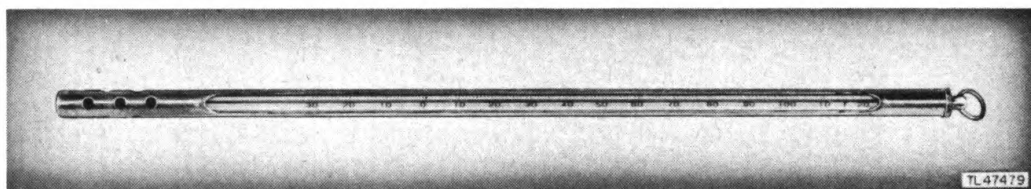


Figure 26. Thermometer and case.

32. THERMOMETER AND CASE (fig. 26).

The thermometer is used for taking temperature readings when making tests with Echo Box TS-207/UP. A table, listing the variations in ringing time of the echo box with changes in temperature, is provided in TM 11-1212, Echo Box TS-207/UP. The thermometer consists of a glass tube with a mercury element and is contained in a metal case 14 inches long and approximately $\frac{3}{8}$ inch in diameter. An aperture in the case permits readings to be taken over a range of from -40° to 120° F. The glass tube is replaceable by unscrewing the cap from the end of the case.

33. PREVENTIVE MAINTENANCE.

Note: Failure or unsatisfactory performance of equipment used by Army Ground Forces and Army Service Forces will be reported on W.D., A.G.O. Form No. 468 (Unsatisfactory Equipment Report); by Army Air Forces, on Army Air Forces Form No. 54 (Unsatisfactory Report). If either form is not available, prepare the data according to the sample form reproduced in figure 27.

a. General. The information in this section is provided to aid the repairman in maintaining the test equipment furnished with Test Set AN/MPM-5. Care should be taken to keep the equipment in good operating condition. Make routine checks and inspections periodically to prevent serious damage to the equipment. For maintenance procedure for the specific test equipment, refer to the relevant technical manual (par. 2).

b. Cords. The cords furnished with the set are rubber covered and are subject to damage, weathering, and deterioration. If proper measures are taken, the useful life of the cords will be greatly extended.

(1) Inspect the cords regularly for worn or damaged insulation. If any such places are found, repair or replace the damaged cord immediately.

(2) When using the test equipment, arrange it so that the cords are not resting on any sharp objects or stretched over the edge of the bench or any test equipment. Make no sharp bends in the cords, since these may result in damage to the wire or insulation.

c. Adapters and Plugs. Clean the plugs and adapters periodically to keep dirt and corrosion from accumulating around the pins and in the threads of the connecting rings. Never force plugs or adapters together when making a connection; the threads may be stripped or the pins may be bent until they are of no further use. Any bent or broken plugs or adapters must be repaired or replaced immediately.

d. Chest CH-273. Clean the chest (fig. 19) periodically to prevent dust and dirt from accumulating in the test sets when they are stored. Scrape off broken or cracked paint and repaint the affected area. Use sandpaper to remove the paint and to prepare the surface for the new coat of paint.

e. Crystals. Crystals must be handled carefully. Do not drop them. In dry climates handle a crystal as little as possible, because static discharges from the fingers will burn out a crystal. Never allow a crystal to be left unshielded near a field of microwave energy; such a field will burn out crystals rapidly.

WAR DEPARTMENT UNSATISFACTORY EQUIPMENT REPORT					
FOR	TECHNICAL SERVICE SIGNAL CORPS	MATERIEL	DATE 15 AUG 1945		
FROM	ORGANIZATION 885 SIGNAL REPAIR COMPANY		STATION APO 888 NEW YORK		
TO	NEXT SUPERIOR HEADQUARTERS SIGNAL OFFICER	STATION ARMY	TECHNICAL SERVICE		
COMPLETE MAJOR ITEM					
NOMENCLATURE SIG. GEN TS-155/UP		TYPE	MODEL		
MANUFACTURER BOONTON RADIO CORP.		U. S. A. RES. NO. 896-MPD-45	SERIAL NO.	DATE RECEIVED 30 MAY 1945	
EQUIPMENT WITH WHICH USED (if applicable)					
DEFECTIVE COMPONENT—DESCRIPTION AND CAUSE OF TROUBLE					
PART NO. R89	TYPE POTENTIOMETER	MANUFACTURER ROYCE RESISTORS		DATE INSTALLED 16 JUNE 1945	
DESCRIPTION OF FAILURE AND PROBABLE CAUSE (if additional space is required, use back of form) POTENTIOMETER BURNED OUT - TOO LOW WATTAGE RATING					
DATE OF INITIAL TROUBLE 2 JUL 1945	TOTAL TIME INSTALLED		TOTAL PERIOD OF OPERATION BEFORE FAILURE		
	YEARS 0	MONTHS 0	DAYS 17	YEARS	MONTHS
				DAYS	HOURS
					MILES
					ROUNDS
BRIEF DESCRIPTION OF UNUSUAL SERVICE CONDITIONS AND ANY REMEDIAL ACTION TAKEN OPERATING IN REGION OF HIGH HUMIDITY					
TRAINING OR SKILL OF USING PERSONNEL		RECOMMENDATIONS (if additional space is required, use back of form)			
POOR	FAIR	GOOD	REPLACE POTENTIOMETER (R89) WITH ONE HAVING A HIGH POWER RATING		
		X			
ORIGINATING OFFICER					
TYPED NAME, GRADE, AND ORGANIZATION HAROLD T. MASON, CAPT., SIG. C. 885 SIGNAL REPAIR COMPANY			SIGNATURE <i>Harold T. Mason</i>		
FIRST ENDORSEMENT					
TO CHIEF	TECHNICAL SERVICE			OFFICE	
NAME, GRADE, AND STATION			STATION		DATE
Instructions					
1. It is imperative that the chief of technical service concerned be advised at the earliest practical moment of any constructional, design, or operational defect in matériel. This form is designed to facilitate such reports and to provide a uniform method of submitting the required data. 2. This form will be used for reporting manufacturing, design, or operational defects in matériel, petroleum fuels, lubricants, and preserving materials with a view to improving and correcting such defects, and for use in recommending modifications of matériel. 3. This form will not be used for reporting failures, isolated material defects or malfunctions of matériel resulting from fair-wear-and-tear or accidental damage nor for the replacement, repair or the issue of parts and equipment. It does not replace currently authorized operational or performance records. 4. Reports of malfunctions and accidents involving ammunition will continue to be submitted as directed in the manner described in AR 730-10 (change No. 3). 5. It will not be practicable or desirable in all cases to fill all blank spaces of the report. However, the report should be as complete as possible in order to expedite necessary corrective action. Additional pertinent information not provided for in the blank spaces should be submitted as inclosures to the form. Photographs, sketches, or other illustrative material are highly desirable. 6. When cases arise where it is necessary to communicate with a chief of service in order to assure safety to personnel, more expeditious means of communication are authorized. This form should be used to confirm reports made by more expeditious means. 7. This form will be made out in triplicate by using or service organization. Two copies will be forwarded direct to the technical service; one copy will be forwarded through command channels. 8. Necessity for using this form will be determined by the using or service troops.					

W. D., A. G. O. FORM No. 488
30 August 1944

This form supersedes W. D., A. G. O. Form No. 488, 1 December 1943, which may be used until existing stocks are exhausted.

U. S. GOVERNMENT PRINTING OFFICE 16-41346-1

TL41743.

Figure 27. Sample Unsatisfactory Equipment Report.

34. UNSATISFACTORY EQUIPMENT REPORT (fig. 27).

a. When trouble in the equipment used by Army Ground Forces or Army Service Forces occurs more often than repair personnel feel is normal, War Department Unsatisfactory Equipment Report, W.D., A.G.O. Form No. 468 (fig. 27), should be filled out and forwarded through channels to the Office of the Chief Signal Officer, Washington 25, D. C.

b. When trouble in equipment used by Army Air Forces occurs more often than repair personnel feel is normal, Army Air Forces Form No. 54 should be filled out and forwarded through channels.

c. If either form is not available, Form No. 468 (fig. 27) may be reproduced, filled out, and forwarded through channels. When Army Air Forces Form No. 54 is required but not available, reproduce Form No. 468 and forward it through channels in accordance with directions on Form No. 468.

15. MAINTENANCE PARTS FOR TEST SET AN/MPM-5.

<i>Signal Corps stock No.</i>	<i>Name of part and description</i>
2Z299-358	ADAPTER M-358.
2Z299-359	ADAPTER M-359.
2A264-23	ANTENNA ASSEMBLY AS-23/AP.
3A30	BATTERY BA-30.
3F3945-5/C1	CAPACITY DIVIDER: Res Const Co type #100-B74.
2Z1800.30	CASE: neon lamp.
6Z1744	CASE, thermometer: H. J. Green type #600.
2Z2599-273	CHEST CH-273.
2Z308-119	CRYSTAL ADAPTER UG-119/UP.
1F430-70	CORD CG-70/MPM.
1F430-71	CORD CG-71/MPM.
3F4325-208	DUMMY ANTENNA TS-208/MPM.
3F4325-207	ECHO BOX TS-207/UP.
3F3945-5/T1	TUNER, emergency receiver: Crosley type #223777.
3F4325-15A	FLUXMETER TS-15A/AP.
2Z5954	LAMP LM-54.
3F3945-5/B1	MULTIPLIER: Crosley type #C-222998.
3F4325-34	OSCILLOSCOPE TS-34/AP.
3F4325-125	POWER METER TS-125/AP.
2Z7226-258	PLUG PL-258.
3F3988-64	PROBE ANTENNA AT-64/U.
2Z7390-30	RADIO FREQUENCY JACK UG-30/U.
3F2440-223A	RANGE CALIBRATOR I-223-A.
3Z6100-184	RESISTOR, dummy load: 1,000 ohms; IRC type #MPR.
3F4325-155A	SIGNAL GENERATOR TS-155A/UP.
3F3866-6	SIGNAL GENERATOR TS-301/U.
6R57585-219	SPANNER WRENCH MX-219/UP.
2Z9323-74	TERMINAL BOX J-74/MPM.
3F4325-210	TEST ANTENNA TS-210/MPM.
6Z8648-3	THERMOMETER: H. J. Green type #213.
2J1N21B	TUBE: xtal; rect; RMA type #1N21B.
3F4325-117	WAVEMETER TEST SET TS-117/GP.

Order No. 2738-MPD-45; 6306 copies; 31 May 1945

